

Optimus Rotor Control Low Speed
replacement
Low Speed Rotor Control (unit 4512 104 7130x / PCB 4512 108 0590x)

Before replacing a low speed rotor control unit carry out the following measures:

If breakers ENF1 / 2 / 3 tripped due to an unknown reason they should not be turned back on. First check:

1) mains supply and distribution

- cut the generator from mains:
remove mains lines from the wall junction box (Optimus RAD = Bucky)
- check that all mains phases are properly connected at the wall junction box and inside of the generator
- the neutral line must also have a low resistance continuity from the mains supply (5-wire mains) to ENX1101/2
or
inside the generator from the 480...400VAC mains adaptation transformer ENT:04 - ENX1101/2 (Optimus RAD only).
- check at open breakers (off condition) that no contact is welded (Ohm-meter)

ENF1	L1 - T1	Optimus 50	2422 129 15514
	L2 - T2	<i>or successor</i>	2422 129 16291
	L3 - T3	Optimus 65/80	2422 129 15513
		<i>or successor</i>	2422 129 16292

ENF2	L1 - T1	Optimus 50/65/80	2422 129 00341
	L2 - T2	<i>or successor</i>	2422 129 16288
	L3 - T3		

ENF3	L1 - T1	Optimus 50/65/80	2422 129 15665
	L2 - T2	<i>or successor</i>	2422 129 16508
	L3 - T3		

- check that no contact of contactor ENK2 is welded (mechanical check: if snap-on auxiliary contacts can not be removed from the main contactor at least one contact is welded)

ENK2	phase 1	1 - 2	Optimus 50/65/80 contactor	2422 132 06621
	phase 2	3 - 4	+ 3 auxiliary contacts NO	2422 135 04355
	phase 3	5 - 6	+ 1 auxiliary contact NC	2422 135 04023
			<i>or successor contactor</i>	2422 132 07381
			+ succ. aux. contact block	2422 135 04664
			+ succ. R/C circuit	2422 135 04661

!! In case one of the contacts is welded the converter DC discharge time will be
!! much longer as the discharging auxiliary contact ENK2 41-42 can not be closed.
!! (600V DC discharge time to < 60V DC approximately **40 seconds**,
!! with open contact **> 11 minutes** !! to be < 60V DC)

2) measurement of stator resistance

The defect of the rotor control unit might have been caused by the stator coils.

Measure the stator phase resistance (for all tubes connected) at the tube (disconnect the stator cable, all **four links** must be present and fixed)

phase U-V **101/103 - 107/109** normally 11 Ohms \pm 1 Ohm
 phase V-W **208/210 - 202/204** normally 9 Ohms \pm 1 Ohm

If measured at the stator relays EWGX11/12 or the stator cable terminal EX1100 add the cable resistance (stator cable must be of screened type 0722 215 02054):

cable resistance (10m single length) + 0.27 Ohms
(3 x 1.31mm²) (15m single length) + 0.40 Ohms
(20m single length) + 0.53 Ohms

3) measurement of stator inductance (if measuring tool available)

It is not sufficient to measure the stator phase resistance only. The resistance measurement might pretend the stator coil is ok. A short-circuit of windings can not be found with an Ohmmeter.

With an inductance meter (e.g. 4512 101 77141) measure at the tube (disconnect stator cable, all **four links** must be present and fixed)

phase U-V **101/103 - 107/109** normally 57mH \pm 10 %
 phase V-W **208/210 - 202/204** normally 34mH \pm 10 %

If the deviation is $> \pm 10\%$ the tube (stator = housing) must be replaced to prevent damages of the rotor control PCB YA100.

4) first turn-on after rotor control 'event'

Check whether the screen of the stator cable is properly grounded at tube and generator side.

If chapters 1)...3) are error-free

or

if parts of the mains distribution have been replaced:

Establish the mains cable at the wall junction box or turn the room mains switch back on.

Turn on all breakers **except ENF3 !** for the rotor control mains supply.

Generators equipped with a mains adaptation transformer ENT 480/400VAC: continue at ***.

Generators installed straight at the mains:

The voltage between PE and neutral must not be higher than 5VRMS. If there are higher voltages try to improve the power supply or install the mains adaptation transformer 9890 000 0230x.

*** If the generator comes to a standby ready state (check the system ready conditions of if not) proceed to the tube extension unit WG chapter 5).

If a WG unit for a 2nd tube is not present, proceed to chapter 6).

5) tube extension EWG check

Breaker ENF3 should still be off but the generator be on.

Check that one of the stator relays EWGK11/12 is energized
(old version relays = small brown indication pin **not** at left edge of the slit)
(*new version relays = brown indicator pulled inside*).
The contactor must not be activated manually.

The contact resistance can not be measured with a regular Ohm-meter as the small current of the meter pretends a very high resistance (as a matter of the silver plated contact area). It must be measured invasive with at least 2 A passing the closed contact. As the contact should have a typical resistance of < 0.1 Ohm, the voltage measured via the contact should not increase 0.2 Volt (with 2A).

EWGK11	phase U	1 - 2	relay	2422 135 03942
	phase V	3 - 4	<i>successor relay</i>	2422 132 07379
	phase W	5 - 6		

EWGK12	phase U	1 - 2
	phase V	3 - 4
	phase W	5 - 6

If the measured value is higher, exchange the relay.

6) replacement of rotor control PCB YA100

Switch off the generator with ENF1 or with the room mains switch.

If chapters 1)...5) are error-free or parts have been replaced, exchange rotor control PCB.

The entire old PCB / unit must be discarded.

It must be disposed of in accordance with the local environmental regulations.